

VALLOMBROSA THE WORLD FAMED FOREST ILLUSTRATED

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The Forester

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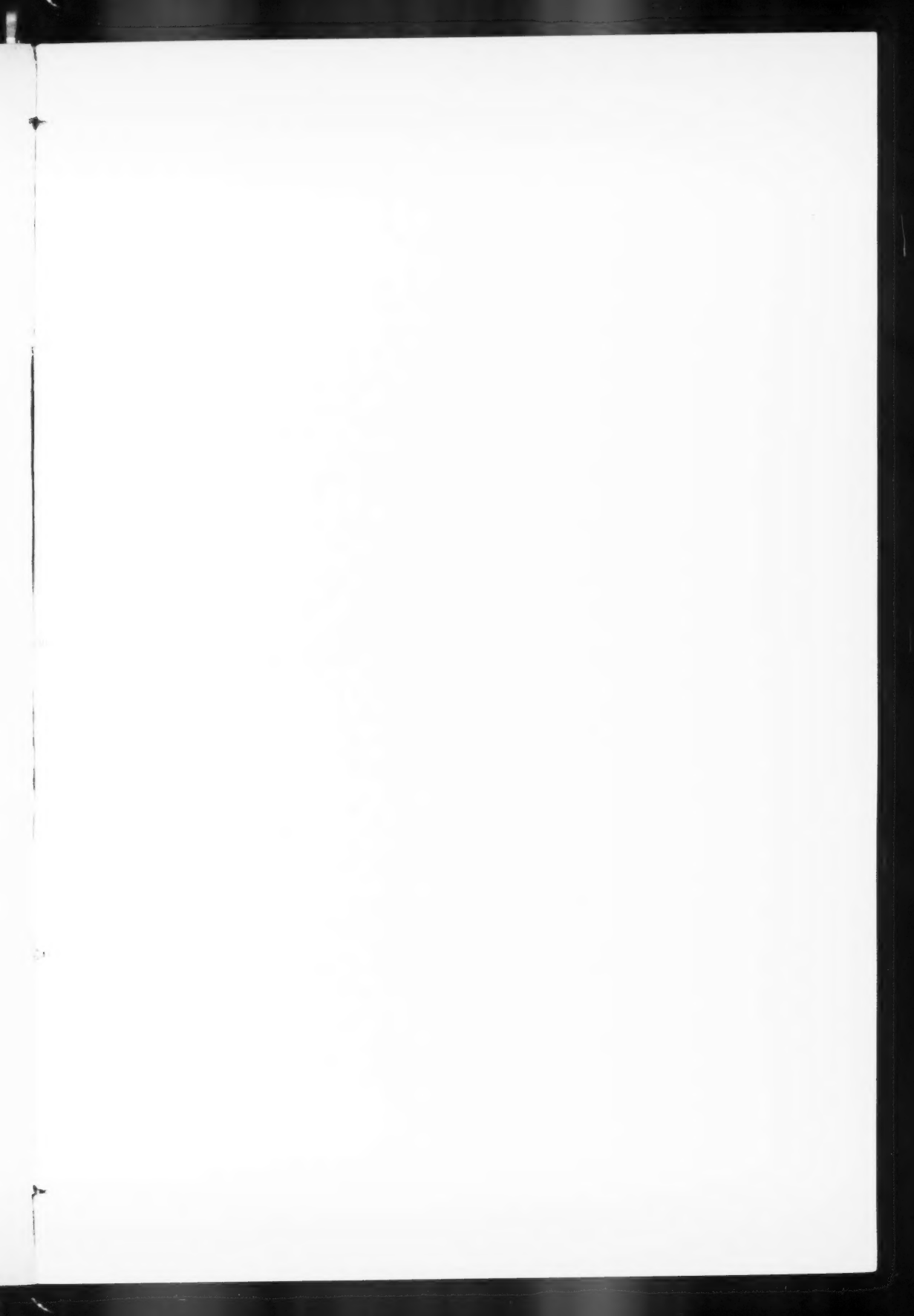
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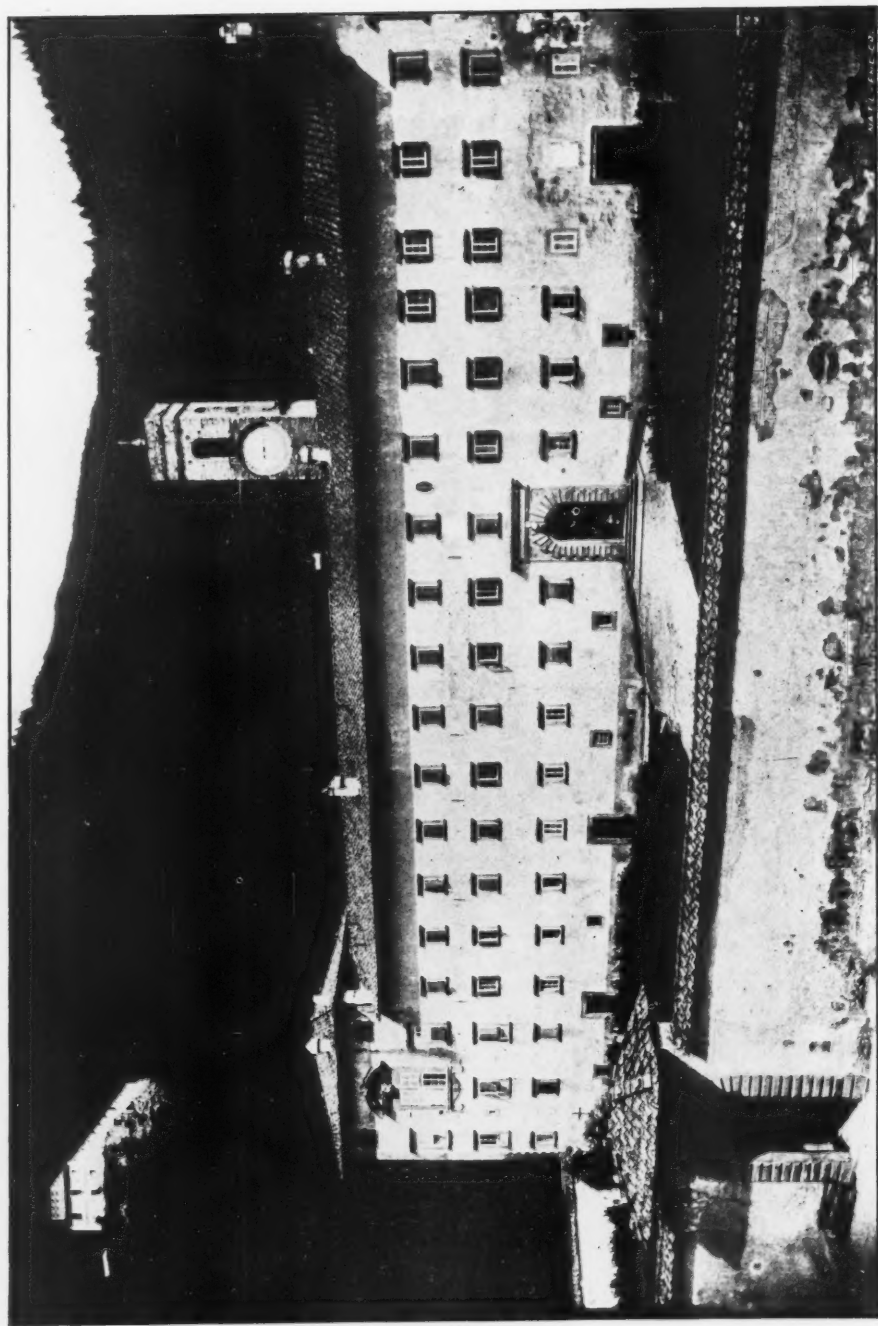


FORESTS

TABLE OF CONTENTS.

VALLOMBROSA.....	Frontispiece
THE WORLD-FAMED FOREST OF VALLOMBROSA. Illustrated.....	121
By the founder of THE FORESTER.	
THE NEW LAKE TAHOE FOREST RESERVE, CALIFORNIA.....	124
(By courtesy of the Secretary of the Interior.)	
FISHERMEN FOR THE FORESTS.....	125
Why Anglers Should Become Members of the American Forestry Association.	
THE RELATION OF FOREST PRESERVATION TO THE PUBLIC WELFARE.....	127
By the Superintendent of the United States Forest Reserves in Montana.	
WHAT SHALL WE DO FOR THE FOREST?.....	129
(A symposium in four papers.)	
I. An Object Lesson of Forest Destruction.	
II. The Need of Forest Legislation in Colorado.	
III. The Advisability of Forest Culture.	
IV. The Increasing Interest in Forest Preservation.	
THE PROPAGATION OF FOREST TREES.....	132
The State Sylvaton Society of North Dakota.	
THE LUMBERMAN'S VIEW OF THE FOREST.....	133
(A symposium in two papers.)	
I. Destruction.	
II. Conservation.	
RECENT LEGISLATION.....	136
New York. Massachusetts. Michigan.	
New Jersey. Minnesota. Colorado.	
California. Wisconsin.	
A LUMBER SCENE IN SAN MATEO COUNTY, CAL.....	136
EDITORIAL.....	138
Special Announcement.	
Necrology—Life Member R. P. Flower.	
A Steady Avance—New Members.	
Chips and Flips—News Items.	
Forest Fires.	
Educational.	
RECENT PUBLICATIONS.....	144





VALLOBROSA—THE ROYAL ITALIAN FORESTRY INSTITUTE.
[Showing Forests of Silver Fir in the background.]

The Forester.

VOL. V.

JUNE, 1899.

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The World-famed Forest of Vallombrosa.

[Seat of the Royal Italian Forestry Institute.]

With Illustrations from Photographs forwarded from Europe especially for
The Forester.

BY THE FOUNDER OF "THE FORESTER."

One of the most attractive places in Europe is Vallombrosa. Every traveler in Italy should not fail to visit it. No matter what his profession he will find something of interest. All admire the beautiful views and the forests and enjoy the fresh, dust-free mountain air and pure spring water, far above the bells and yells and smells of Italian cities.

The word Vallombrosa itself means "shady valley." "Thick as autumnal leaves that strow the brooks in Vallombrosa, where the Etrurian shades high overarched embower," says Milton, who visited this lovely spot before he lost his sight.

Such a place in Italy, where the forests have been recklessly wasted, where almost every tree is lopped and pollarded and where the mountains are bare, the streams dry at times, at others rushing, raging torrents, is certainly refreshing.

Vallombrosa was formerly one of the richest and most famous of the monasteries of Europe, and is now of special interest to foresters because the only forestry school in Italy is located here. It may be easily visited from Florence. At S. Ellero, a short distance up the Arno, on the main line to Rome, the traveler must change cars. High on the mountain top in the distance Vallombrosa is partly visible, as a mass of dark

green foliage surrounded by bare mountain sides. The little train, consisting of one car and a small locomotive, ascends by means of a cog-wheel working in a toothed middle rail. The engine was built in Philadelphia and the car in Belgium, although the latter was finished in American pine.

The train passes through many well-kept olive groves and vineyards, the scenery being very beautiful. The fruit trees were in full bloom (April 5) and the olives were a rich, silvery color. Women dressed in bright-colored costumes were working in the soil, the men were lopping the trees, to which the vines are tied with willow withes. Others were ploughing the rich, brown earth with teams of large, pure white oxen.

Trees in Italy are planted for vine props. The clippings they yield serve for fuel and the leaves are used for fodder. The twigs take the place of twine. Italian agriculture is partly arboriculture. Almost every field yields grapes, nuts, figs, olives, wood, fodder and grain.

We passed through a coppice of chestnut and oak with large mother trees on the steep mountain side. The ground was carpeted with broom, gorse and many other wild flowers, among which we could hear the busy honey bees humming. The woods were filled with song

birds, something unusual for Italy, where formerly birds of every kind were captured for the pot in a wholesale fashion, by means of ingenious nets. A few sheep were visible, rambling amongst the herbage. Here and there choppers were cutting the young chestnut trees for vine props, stripping off the bark, dipping the ends in tar, and binding up the fagots.

In season, many peasants are occupied in picking the wild strawberries and raspberries and gathering mushrooms. A large income is yielded by the chestnuts, from the flour of which the bread of the peasants is made.

In the course of an hour the train reaches Saltino, the terminus. Below one, stretching for miles, is the well-tilled valley of the Arno; all about one the bare mountain tops of the Apennines; and plainly in the distance the famous city of Florence, with its extensive gardens and treasures of art.

About half a mile from the station of Saltino, the beautiful silver fir forests of Vallombrosa begin. The trees are large, with tall, straight boles and dense, dark green canopy. The air is fragrant with the orange perfume exhaled by the leaves in the sunshine. One could easily imagine himself in the midst of the Black Forest at Herrenwies or St. Blasien.

The trees are in lines, betraying the fact that they had been planted. In truth the whole of the forests of Vallombrosa were planted by the patient and industrious Benedictine monks, who were arduous agriculturists and foresters during the Dark Ages. It is to them in fact that civilization owes much, and it was often with much injustice that their properties were confiscated and their treasures of art and science injured or destroyed. Some beautiful stems, fit for the masts of ships, were piled by the wayside. They seemed almost out of place in a land where twigs and fuel are often sold by weight, and where a decent fire is the greatest of all luxuries.

Soon one reaches an open meadow, surrounded on all but one of its sides by the amphitheater of green, forest-clad

hills. It was here, in about the year 1015, that San Giovanni Gualberto founded the famous monastery of Vallombrosa, under peculiar circumstances too lengthy to describe in this connection.

Above the Silver Fir on the mountain side a fine forest of old Beech is visible. The Silver Fir being more hardy is usually above the Beech. In order of hardiness there comes first the Spruce, then the Silver Fir, then the Red Beech, and then the Chestnut. The monks, no doubt, had some special purpose in placing the Beech above the Fir. They raised many pigs which fed upon the mast.

In front of the thick-walled monastery is the Albergo della Foresta, which is large and comfortable. Near by there is an old sawmill and ponds built by the monks for the collection of ice. The water here is excellent, coming from a famous spring which was long supposed to have great curative properties. Several students dressed in uniform were working in the nurseries. They are called to their work by bugle blasts.

We presented our cards and were most cordially received by the director, Comm. F. Piccioli, and his accomplished daughter, both of whom speak German and French. Director Piccioli was sent by his government to France to study the reforestation of mountains, and his report, entitled "*Sui Rimboschimenti Eseguiti in Francia*," appeared in 1887.

We were shown the museum, the library, the dormitory, the queer old kitchen and the refectory, with many portraits on the walls, including one of Gualberto, the founder of the monastery. The institution has eight professors and about 35 students. These students are of two classes—those who expect government work and those who do not. The Italian Government possesses only about 50,000 hectares of forest, so that the number of foresters needed is not large and their pay is small. The students have four months vacation in winter. From the prospectus the regulations seem rather strict. The course covers

four years and seems quite like the work of a German forest academy.

Italy could not have a better object lesson. She has had it many years and it seems to have little effect. Were all her mountains forested as at Vallombrosa

planted these forests and instituted an excellent system of agriculture, and that much blame is due the Italian Government for not following this excellent example by planting the denuded mountain tops—the birthplace of destructive tor-



ANOTHER VIEW OF VALLOMBROSA.

she would be rich instead of poor. If she had them it is doubtful, though, whether they would be properly managed.

One leaves this beautiful region with regret and with the thought that much credit is due to the old monks who

rents, and certainly the places above all others which should be owned and regulated by the State.

JOHN GIFFORD, D. CEC.
Florence, April 16, 1899.

The New Lake Tahoe Forest Reserve, California.

President McKinley issued a proclamation on April 13, establishing the Lake Tahoe Forest Reserve, in California, upon the recommendation of the Secretary of the Interior, after a very thorough examination of the subject had been made by that Department, during a period of two years. The area of the reserve is estimated at 136,335 acres.

On November 16, 1896, the Department of the Interior referred to the General Land Office the petition of residents of Carson City, Nev., to have certain lands in El Dorado County, California, in the immediate vicinity of Lake Tahoe, reserved for further disposal and set apart as a public park. Among the signers to this and other similar petitions were the Governor of Nevada, the Chief Justice of the Nevada Supreme Court, the State Treasurer, the Attorney General and other State officers, the University of California (including the Lick Observatory), the Leland Stanford, Junior, University, the Sierra Club, United States Senators Stephen M. White and George C. Perkins, and many other citizens of California.

As the result of a special examination of these lands and their suitability for a forest reserve, the agent of the Department made a favorable report in December, 1897, which is, in part, as follows:

"The land embraced within the boundaries of this proposed reservation is all rough and mountainous with but little, if any, agricultural land. There are no public traveled roads and but few trails in this territory.

"The elevation at Lake Tahoe is 6,200 feet above sea level, and all of the land in the proposed reservation is at a still higher elevation, and consequently is free from snow only in the lower portion for about four months in the year. Included in the territory are mountains which are never free from snow.

"The scenic features of the proposed territory are of the finest possible description and will attract tourists from

all parts of the world. The highest mountains between Lassen's Butte, on the north, and the Yosemite Reservation on the south, a distance of several hundred miles, are included within this proposed reservation, as will appear from a map of the Sierra Valley.

"Fine forests of Pine and Fir are scattered throughout the proposed reservation, and constitute one of the most interesting features of the landscape. The general elevation is too great for dense forests of Pine, or Pine of as large growth as may be found in the Sierras at a lower plane, but the forests are interesting and exceedingly valuable in preventing the rapid melting of the snows.

"What people there are in this district are only Summer inhabitants, that is to say, they drive their flocks to this region the latter part of June, pasture them in the meadows and on the mountain sides, and then return in October to the valleys below. I did not find any one except those connected with the fine hotels about Lake Tahoe, who remain in this region during the Winter. Snow not unusually falls in this region to an aggregate depth of twenty feet. The land is of no possible value except for grazing purposes in the narrow valleys during three or four months in the year.

"Scattered through this region are many lakes. Some of them have been stocked with fish and have become a place of considerable resort for mountain tourists. If this plan of making a forest reservation is carried out, it will be the most convenient of access of any reservation in California, and will be much more visited than any other, and a great National Park established, easily accessible to all the people, and one which will be visited much more than any other.

"The region is so attractive that already many hotels and watering places have been established and seem to receive a large patronage. Benefit will result to all the people of the country by

the establishment of such a National Park for their use, and as time passes these benefits will be appreciated more and more."

On February 10, 1899, after a further examination and reconsideration of the proposed boundaries, in response to the requests of various petitioners, a revised

plan, comprising seven townships, was recommended as satisfactory to all the interests involved. There are a few claims of record within the limits of the reservation, but their acreage forms so small a part of the total area that their existence presents no difficulties to the administration of the reserve.

Fishermen for the Forests.

Why Anglers Should Become Members of the American Forestry Association.

Although it has to do only with their pleasure, yet anglers, more than most men, are interested in the preservation of the water supply. Fish must swim. Without water there can be no fish, and the angler who appreciates the conditions governing the water supply is one of the strongest advocates of forest preservation. There are a thousand reasons why he wishes to have forests about the brooks and lakes that he fishes.

As we become better acquainted with the result of fish culture, the economic aspect of fish and fishing has come to be regarded as more and more important, and this is a consideration which should appeal strongly to the average man; but after all it is not with such results that the angler chiefly concerns himself. He loves his art less for the fish that it yields him than for the recreation it affords, for the opportunity to employ his skill, and for the absolute rest which he derives from an occupation so different from that of most of his life. Yet, if there were no hope of catching fish, he would not care to be an angler, and so he greatly desires to have the fish supply preserved and increased. Without an abundant supply of pure water of the proper temperature, this cannot be done and that water cannot be had without the forests.

The forest and its floor have been aptly enough compared to a great

sponge, which the melting snows and the Spring rains fill full of water, and which holds this water, giving it out by innumerable springs and rills through the dry months, to make glad the thirsty earth. This is above all things the function of the forest: to gather water, to hold it, and to send it out again little by little, so that it may do the most good possible. On the forests depend the water supply, the food supply and the shelter for the fish. They regulate, too, the temperature and purity of the water, and are the home of much of the food which supports the fish. In view of all this it is not strange that anglers as a rule are earnest advocates of forest preservation.

These are some of the reasons that they give for the faith that is in them.

Well-wooded districts are subject to more rain than treeless regions; and the forests are vast reservoirs of humidity, lessening the dryness of the surrounding atmosphere, assisting the flow of spring and stream, preventing freshets at the end of the Winter, and in Summer feeding spring and lake giving forth the clear and cold water in which fish delight and thrive. On the other hand we know that when the forests are destroyed the volume of the waterflow is diminished and the fish is injured in many ways. The disastrous freshets, which are likely to occur, follow the melting snows or the Spring rains, sweep

down mud, sand and debris, covering the spawning ground and the eggs which are on them, suffocating them and the young fish, or perhaps even floating eggs and fry out of the stream, and, when the water recedes, leaving them high and dry on the bank to perish. Besides this, freshets wash away and cover up food and the sources of food supply, so that the stream cannot support so great a number of fish. Trees and shrubs keep the water cool by their shade and furnish a resting place and cover for food for the fish, so that it will nearly always be found that shaded brooks or those running in part through woodland offer to the angler better results than those which flow through open meadows or plains.

In ponds and small lakes, in which the water supply has been diminished, the shallow water freezing nearly to the bottom gives less freedom to the fish, diminishes the air space for each, and is likely to cause wholesale destruction. Such diminished water supply, of course, means a lessened area to the lake or pond, which again means a less number of fish. In like manner the reduced shore line of the pond of lessened area gives less feeding ground for the fish, and so less food.

It is in the game fish that the angler is especially interested, and it is for their protection that he chiefly cares. They live in fresh-water streams, and push their way as fast as possible toward the heads of those streams, into the depths of the woods or high up on the mountain side, striving always to reach those sources where the water, cooled and purified by the influence of the forest,

is at its best. To preserve the best sort of fish, therefore, we must preserve the forests, and each angler should do his part to strengthen the public sentiment in favor of this work. If the past few years have seen an extraordinary growth of this sentiment, it is hoped that those to follow will see one still greater.

So far as the water and its inhabitants are concerned, the forest acts as a great governor or regulator. As it cools the summer stream, so it warms the same stream in winter; as it prevents bank-bursting freshets which may cause incalculable harm, so in time of drought it supplies from its secret sources an equable, unfailing flow which gives life to the fish and to all things that live in the water and along the river's bank. And since the forests regulate the water supply and its temperature and purify it, it may fairly be said that those who care for the forests care also for the fish in the stream, and that when they preserve the forests they preserve also the game fish.

The summer traveler who journeys along the sun-baked, treeless slopes of the southern Rocky Mountains or the Sierras comes now and then upon a dry watercourse in which, if he follows it up and down, he will sometimes see a pool standing in which trout are moving sluggishly here and there waiting for the passage of the week's drought which shall destroy them. Further to the north, in the same chain of mountains, where man or man's fire has not swept away all the timber, this is not seen. There the streams are ever-flowing and the fish are active and full of life.

GEO. BIRD GRINNELL.

The Relation of Forest Preservation to the Public Welfare.

(Being an address delivered on Arbor Day at the Montana State University at Missoula.)

BY THE SUPERINTENDENT OF THE UNITED STATES FOREST RESERVES IN MONTANA.

The celebration of Arbor Day seems a most fitting occasion to consider briefly the great question of our forests and to note how we, as a nation, are guarding a most priceless heritage.

When the Puritans of New England and the chevaliers of Virginia blazed pathways in the primeval forests, made clearings, and laid waste vast areas of mighty Oaks, sturdy Elms, and giant Hickories, it was deemed by them essential and proper for the onward march of civilization and necessary for the productiveness of the country. Conditions have very materially changed since then, and as we stand at the dawn of the Twentieth Century, we begin to realize what the loss of our mighty forests means. We begin to estimate their value not alone in dollars and cents, but as affecting our water supply and as an adjunct to human as well as animal and vegetable life, and we are now crying aloud and long: "Oh! Woodman spare that Tree."

I believe it is right and proper that the subject of our forests should be brought to the attention of our teachers and of our schools, and that in the school-room should be laid the foundation for the rational treatment of the same. The public generally, in years past, has given but scanty attention to this great subject, but if the youth of our land could but be brought to understand the momentous interests at stake the public would gradually be led to realize the importance of the question.

The forest area of the United States (exclusive of Alaska and our recent acquisitions) is estimated in round numbers at 500,000,000 acres. Seven-tenths of this is found on the Atlantic coast, one-tenth on the Pacific, one-tenth in the Rocky Mountains, and the balance scattered over the middle Western States.

On the Pacific coast hard woods are rare, the principal growth being coniferous and of extraordinary development. Here we find the gigantic Red woods, the soft Sugar Pine, the hard Bull Pine, as well as Spruces, Firs, Cedars, Hemlocks and Larch. In the Rocky Mountains we have no hard woods of any great commercial value, the growth being mainly Spruces, Firs, Pines and Cedars. In the Southern States we find the Cypress and a great growth of hardwoods with some conifers and some small quantities of Spruce, Fir and Hemlocks. In the north Atlantic States we find hardwood with conifers intermixed, and the same along the lakes, in Michigan, Wisconsin and Minnesota.

In 1896 it was estimated that there was then standing throughout the United States 2,300,000,000,000 feet, board measure, of timber. In the census of 1890 the value of forest products was estimated at \$1,044,000,000. The value exceeds ten times the value of our gold and silver output, and three times the annual product of all our mineral and coal mines put together. It is three times the value of our wheat crop, and with all the toil and risk which our agricultural crops involve they can barely quadruple the value of the product yielded by nature for the mere harvesting.

The total annual cut is estimated at 40,000,000,000 feet, board measure, and to this let us add the amount consumed for fuel, fence material, the waste in the woods and at the mills, and the loss by fires, and we find that the total annual consumption of wood in the United States is easily 25,000,000,000 cubic feet, and this consumption, it is said, increases in greater proportion than the population.

In considering this vast consumption of wood it is interesting for Montanians

to know that Butte City alone consumes 300 carloads of cordwood a day. The loss by fires varies from year to year, but it is enormous, especially in the West. It is estimated there is an annual loss of \$25,000,000—and this is exceeded in some years. From careful statistics and records we know that the annual growth of wood per acre and year does not average more than fifty-five cubic feet, though, under favorable conditions, it may rise to double that amount with some species. If we consider the production of such sizes as are used in this country our timber, at the age of 125 years, would be found to have grown not more than thirty-five cubic feet per acre per year.

Our present forest acreage, therefore, even if well stocked and well managed, could not produce our annual consumption. We are consuming much more than the area produces, probable double this amount, and every year the disproportion increases. It takes 100 years to produce a good-sized saw log. Most of the timber we are now cutting is over 200 years old. It is said that at the present rate of denudation going on in Minnesota that in forty years there will not be a stick of timber left, and at the present rate of cutting in Maine in eight years its once grand forests of Pine will be no more. In the light of these facts and figures, taken largely from governmental statistics and believed to be accurate and reliable, should we not, as a people, pause and consider the situation that stares us in the face?

Having considered, so far, only the commercial or money interests as attached to our forest production, let us now consider other features of this subject. Science has demonstrated that "forests temper the extremes of climate, equalize the rainfall, equalize the flow of streams, and so preserve fertility and increase comfort." The humus in the forest cover is nature's reservoir, the forest cover affords a natural watershed. The melted snows of winter and the spring rains find lodgment there, gradually and naturally the many springs in

our mountains are fed, and in turn are the creeks and larger streams. A certain amount of humidity is disseminated, essential to vegetable, animal and even human life, and all nature, animate and inanimate, feels the life-giving qualities, the refreshing influences given or exerted by the forests under the mighty hand of Omnipotence.

Denude our forests and what are the results? The humus becomes hard and packed, being exposed to the hot rays of the sun in summer and to winter's cold blasts, the forest cover disappears, the melting snow and the heavy rainfall, not being able to percolate gradually and naturally through the hard packed soil, rushes off down the mountain side, swelling all the creeks and larger streams and creating floods that cause immense damage. Later, their source of supply having become exhausted, the springs cease to flow, the creeks dry up, the streams are but empty channels through the parched land, and drought appears, vegetable and animal life droop and wither, and a baneful condition of affairs prevails. The preservation of our forests is essential, therefore, to other interests than those of the woodsman.

The National Government proposes to save what yet remains of our grand forests. To this end the executive proclamation of February 22, 1897, thirteen forest reservations, with an aggregate area of 21,379,840 acres, were established, and the President is empowered to increase the number whenever, in his judgment, it appears wise and necessary. The management of these reservations is placed in the hands of the Commissioner of the General Land Office, Department of the Interior, Washington, D. C. In Montana there are four forest reservations at present with an aggregate area of 5,043,680 acres, over one-fourth of all yet established in the United States. Each reserve has one superintendent and a number of rangers. These latter daily patrol a certain prescribed territory in the reserve to which they are assigned, and are ever vigilant against

fires, an evil that does more than any other one thing to destroy our forests. It is also their duty to prevent timber depredations, infringement against the land laws of the country and to enforce the State laws in protection of game and fish within the limits of the respective reserves.

This is a subject which should be dear to the heart of every true American; it

is a subject so large, of such immeasurable possibilities, of so vast importance, that a far abler pen than mine is needed to adequately set forth its value. Other nations receive great profit from their forests, why should not we? And then think of the future, think of posterity. My friends, it will, and it has a right, to hold us, in this enlightened age, responsible.

J. BLATCHFORD COLLINS.

What Shall We Do For The Forest?

A Symposium in Four Papers.

I. AN OBJECT LESSON OF FOREST DESTRUCTION.

There is an "object lesson" of forest destruction on the regimen of water-flow in the streams and ravines of Jefferson County, Colorado, and its mountain neighbors, the mining counties of Gilpin and Clear Creek, since their settlement forty years ago. My observations began in May, 1860, and have been more or less continuous since that period, excepting from May, 1862, to August, 1856, at which latter date I returned from army life.

In 1860 the creek valleys and the mountains of these three counties were filled with Pines and Firs, and the creek bottoms were fringed with Alders and Willows. Clear brooks, never dry in mid-summer, were to be found in every bushy ravine. Vasque Fork of the South Platte (now called Clear Creek) flowed clear. Snows and rains never swelled it disastrously, even in June, and its affluents rarely appeared discolored by mud, which in the main stream itself was but very slightly discolored. Beautiful trout abounded in all the larger creeks, and well it deserved the name of Clear Creek.

In 1860-61-62 the unceasing rush to the gold mines of these three counties began the wholesale destruction of their forest for fuel and mine timbering and for the erection of thousands of cabins

and stamp mills, mining timbers especially requiring the best trees. This wholesale consumption of our forest was still further hastened by destructive fires caused by criminal carelessness and indifference.

As these elements of use continued unabated as years rolled on, in 1875-76 all the trees surrounding the mining camps and those in the most accessible slopes disappeared until the denudation forced the mills, mines and saw-mills to draw their supplies from the denser forests of central ranges, while the sparsely-timbered foot-hills occupied by farms, and the necessities of the prairie farmers for fuel and fencing completed the denudation of all the accessible trees of the foot-hills.

Following this condition in the seventies, Clear Creek and its affluents, Ralston, Beaver, North Fork Clear Creek and Soda Creek, began to show the force of denudation of forest growth. The winter snows melted more rapidly on the bare mountain slopes, and their drainage increased in rapidity, followed, as the result, with total cessation of flow or remarkable and early diminution of their former abundant supply. The smaller gulches which, in the Spring, when sheltered by Willows and timber growth, gave

out a very appreciable amount of water were totally dry or, when recipients of rains and cloud-bursts, emptied the gathered water-fall into Clear Creek in two or three hours, hurling down and carrying into the parent stream all the rich vegetable mould of their narrow valleys which had been stored there, during past ages, from the decomposition of vegetable matter. So that to-day, where twenty-five years ago there stood a vigorous growth of trees and under-shrubs, we see the alluvial soil washed to bed-rock, in some cases twenty feet or more deep, while everywhere the original wagon roads, opened in the low grounds of the gulches and creeks, have been moved at great expense to the more rocky mountain slopes, away from the violence of sudden floods.

Nor is this all. The denudation of tree growth in all our mountains, on the summits of the foot-hills, as well as in the valleys, has furrowed with ravines and covered with sand and loose rock acres of good soil, and on Bear Creek utterly spoiled meadow and cultivated land, every rain in June, July and August adding yearly to this calamity.

Another element of injury seems to act with increasing yearly fury. Bare mountain slopes and fields, heated by the torrid rays of the June and July sun, seem to create, by the force of ascending currents of heated air, disastrous hail-storms, accompanied by violent thunder-storms, which wreak their fury on the crops and fruit-trees and gardens of the prairie farms near the foot-hills. Forty years

ago this condition was almost unknown, or else was trifling in effect.

In 1898 hail fell in Jefferson County, east of Gulden, with terrific violence in a swath nearly three miles wide and of indefinite length. To the eastward apple, plum and pear trees, stripped of all their leaves, fruit and flowers, raspberry, blackberry and strawberry beds were annihilated almost completely, while growing wheat, oat and corn fields were beaten down and their yield much lessened from the weakness of their aftergrowth. The hail, rain and thunder storm of July 24, 1894, will long be remembered in Jefferson County for its violence, destruction and loss of life. The accompanying heavy rain on the foot-hills hurled down vast accumulations of boulders, gravel and soil into the valleys of Beaver, Bear and Clear Creeks, and swelled the streams in some places to twenty feet or more in depth. Boulders weighing two tons or more were floated down one and one-half miles into Clear Creek, the flood waters leaving beds of shingle and soil and gravel mixed where cultivated fields stood, while on Bear Creek twenty-two lives were lost in the flood. Hail stood in piles from one to one and one-half feet in depth. The storm came from the northwest. It was a veritable object lesson.

I have gauged the water-flow of Clear Creek repeatedly since September 20, 1860, and give the following figures, showing difference of flow up to September 15, 1880, at the same location of gauging:

Sept. 20, 1860, width of stream, 53 ft. ; veloc. per sec., 3.60 ; area, 101.

Sept. 19, 1879, width of stream, 32 ft. ; veloc. per sec., 2.38 ; area, 46.15.

Sept. 15, 1880, width of stream, 34 ft. ; veloc. per sec., 2.23 ; area, 38.22.

Greatest flow gauged at same point—
June 10, 1872, width of stream, 62.65 ;
velocity per second, 4.27 ; area, 280.23.

Least flow gauged at same point—
March 22, 1880, width of stream, 31 feet ;
velocity, 2.04 ; area, 25.72.

E. L. BERTHOUD.

II. THE NEED OF FOREST LEGISLATION IN COLORADO.

The experience of the past year has emphasized the need of strict legislation for the protection of what forest lands are still in existence in Colorado. During the latter part of last October and during the whole of November forest fires raged in our mountains. I traveled over a great part of the State and can hardly express my indignation at the wanton waste of timber. Good work is being done in other States to preserve forest lands, but the problem confronting us here cannot be solved in such a way. For us it is necessary both to save and to replant.

I am sure a practical solution of the difficulty would be made if forest conservators were aware of the opportunities still open here. There are some ways in which much could be achieved. For example, our State Land Board is in the habit of selling stumpage—ten cents a tree or so—and then the saw-mill man and tie-cutter practically take what they want and then pay the State as much or

as little as they please, burning Government and State forests to cover their tracks.

We might do something if some such plan could be put into operation here as has been done in Asheville, N. C. It seems impossible to convict despoilers or those committing arson on Government lands. Private ownership appears to be the only solution.

I rode through the forest of white pines between Durango and Pogosa Springs. It is forty miles wide and practically untouched. I rode through another piece of woodland, some eight or ten miles square, north of Creede. In Routt County there is much fine timber that could be saved. But the eastern slope of the mountains has been cut and burnt into a desolation, and during the last autumn more timber has been burnt in Colorado than has been legitimately used during the last forty years.

HENRY MICHELSEN,
Denver, Col.

III. THE ADVISABILITY OF FOREST CULTURE.

There is no subject of so much public importance, locally considered, as forest tree culture. We say locally considered, meaning to apply the remark to Southern California. Here, it is safe to say, the planting of forest trees is more needed than in almost any other portion of the United States. Fertile as this country is, strip it entirely of trees and it would become a desert. If the rain-makers would give their attention to planting trees they would accomplish something worth while.

There is no better way to conserve that dampness which insures fertility than by planting and protecting forest trees, and there is no such sure way of converting a country into a desert as by

destroying the forests. When Western New York was clad with primeval forests it was penetrated everywhere by "mill stream." Since the original woods have been mostly cleared away these mill streams have been nearly all dried up and the mills that once ran by water-power, and with plenty of it, are now either shut down or are running with steam.

Other countries recognize the necessity of preserving their forests. In Germany the laws are very strict on that subject. Every man is obliged to recognize the advantage to the public at large in preserving the forest trees on his own land. But our own legislators have not had time to consider subjects of such great and lasting importance as forest tree culture.
—*Editorial, Santa Monica, Cal., Outlook.*

IV. THE INCREASING INTEREST IN FOREST PRESERVATION.

It is encouraging to note that an increasing interest is being taken by the people of this section on the subject of forest preservation. This is an important subject, in any part of the country. Already, in the East, apprehension is expressed at the rapidity with which the great forests of the Northwest and North are being denuded, not only for lumber, but in the ever-increasing demand for wood pulp in the manufacture of paper. It is now suggested that the Government should permit wood and wood pulp to come in free from Canada, so that there may be less inducement to cut down the American forests in such wholesale manner.

If the question of forest preservation is such an important one in other parts of the country, which enjoy a regular rainfall throughout the year, how much more so is it here, in Southern California, where our farmers have to depend so largely upon irrigation for crops. The supply of water for irrigation depends mainly on the condition of the wood growing on the mountains. Where it has been swept bare by fire, the rain, when it comes, runs off in torrents, cutting up the mountain sides, and often causing floods in the valley below, whereas, when the slopes of the moun-

tains are well covered with trees and underbrush, the rain soaks in slowly, and most of it reaches the valley in shape to be of service to the horticulturists. Damage equal to that done by fire is often worked by bands of sheep, which eat off every vestige of a green thing and tear the thin soil from the rocks with their hoofs.

While we are making provision for the protection of our forest reservations, we should not lose sight of the necessity of doing something to replant the stretches of forests that have been destroyed by fire during the past few years. It is a noteworthy fact that there is no river in Southern California which has been so much denuded in its upper stretches as the San Gabriel, where the damage done to agricultural lands in that valley increases steadily as the forests on the mountains are destroyed.

When it is considered that, in addition to the material advantage derived from the mountain forests, they have also an æsthetic side, and that this section obtains many millions of dollars every year from tourists, we certainly ought not to hesitate over the moderate expense of replanting these bare and uninviting mountain slopes.—*Editorial, Los Angeles, Cal., Times.*

The Propagation of Forest Trees.

Energetic Work of the State Sylvaton Society in North Dakota.

Public interest in the propagation of forest trees in North Dakota is being greatly stimulated by the energetic efforts of the State Sylvaton Society, and its originator, W. W. Barrett, State Superintendent of Irrigation and Forestry in that State. During the past month Mr. Barrett has sent out personally over one and one-half million of Box Elder and White Ash seeds to the county superintendents of schools for distribution in all the schools in the State, to be planted by the scholars, not only in the school

grounds, but at their homes, on the farms, and in the city and village lots.

"As the twig is bent, the tree is inclined"; as trained in youth so fixed in manhood years. According to the *Bismarck Tribune*, Mr. Barrett and his brothers became interested in the raising of trees in Maine, where they operated a nursery on the old homestead farm. They are now practical foresters in their respective States—Maine, California, North Dakota and Minnesota.

Ten years ago when running his farm

with three plodding oxen, near Church's Ferry, N. D., Mr. Barrett became convinced that the great need of the West was a large increase of trees and forests for producing the most favorable climatic and crop conditions, and the furnishing of fuel, building and fence material. Advocating tree culture as a prime factor in diversified farming, the present Forest Commissioner mapped out his present system of tree culture and the artificial use of water, when needed in cultural pursuits, devoting two years, at his own expense, to bring to consummation the creation of the Department of Irrigation, Forestry and Fish.

In order to interest the young in the subject of forestry, he originated in 1892 the Sylvaton System, which received the highest award at the World's Columbian Fair of 1893. The system has been fully organized; the aims and objects of the members of the State and local Sylvaton societies are set forth in twenty-five tenets. One of the leading ideas is to enlarge the school grounds, fence the same and convert the premises into attractive Sylvaton parks.

During the past two years the State Sylvaton Society, at the private expense of the State Superintendent, has fur-

nished forest seeds and seedlings to numerous schools. The pupils have planted the stock in the school yards and also near their homes in the country and in the villages and cities. Many trees have thus been started and made good and substantial growths under the tender and watchful care of the young boys and girls of those schools. This year the original plan has been enlarged and forest seeds have been sent out in behalf of the society to every pupil in North Dakota. The seeds selected were the best to be found in the State; all were stripped from the stems and put up in packages convenient for handling, and were then duly shipped for distribution, with circulars and directions for planting.

The repeal of the State law providing a bounty for tree culture has made the plans of the society all the more beneficent. In addition to the school distribution there has been furnished an additional lot of 500,000 seeds to be used in starting the Sylvaton Home, School and Church Nurseries, making a total of two millions of seeds. If this practical work is continued from year to year, under a proper tillage of the trees, North Dakota bids fair to become the tree home land of the great Northwest.

The Lumberman's View of The Forest.

A Symposium in Two Papers.

I. DESTRUCTION.

With lumbermen accustomed to life in the green pine-woods, the desolation of the cut and burned-over lands is felt most keenly. Passing through charred stumps and bleaching stubs, he feels as one moving through a cemetery where, at every step, he is reminded of lost friends. These sad reminiscences are useful. They start conceptions of what might have been; of a better way.

Several lumbermen, in talking about the matter, have in substance said: "If we could get timber-lands in a compact body, then we could perhaps do some-

thing in forestry; but, as we are now, limited to alternate sections, our lands are isolated; our border lines are greatly extended. Irresponsible and careless parties have free access to our property. We cannot protect ourselves.

There are as many tramps in the woods as elsewhere. They come to our camps, perhaps ask for work, get board over night, perhaps several days, then leave as unexpectedly as they came. In summer they stop in our vacant camps and often set fire to them. They are utterly careless of property and sometimes de-

light in destroying it. After lighting their pipes, they drop the burning matches into the grass. They camp along the trails and roads and leave their fires unextinguished. They have been known to start fires just for the wanton satisfaction of seeing them burn.

Sometimes the settler in the remote woods is quite as much of a nuisance. Often they are people who like no restraint and who have come to the woods to avoid living under the immediate restraint of the law. They range about, hunting, fishing, stealing timber, building fires for their lunches and camps against trees or in black muck or rotten trunks that hold the fire. Usually the first summer they burn over a lot of the adjoining land to allow grass to spring up and make pasture for their cattle, regardless of the timber they kill or the extent of country over which the fire spreads. When very dry, so a thorough "burn" can be made, they put fire in the slashings they have been making during the year and simply let it go.

If a lumberman could acquire timber

in a compact body—a township or more—he could do something to protect himself. He could clear strips of land around the borders, cultivate vegetables, hay or grain, and thus have a good fire-break. He could demand an explanation for the presence of any one found upon the land.

With timber and stump land thus protected against fire, he could establish a permanent business, put in a substantial mill, build up a town, and, by cutting the land in rotation, he could keep the woods green and productive instead of desolating them as he does now.

The lumberman is ashamed of the result of the present custom, but it is not in his power to improve the present state of affairs. The manner in which a large part of the public domain has been disposed of makes forest preservation seem impossible. A more thorough system could hardly be devised, in my opinion, for the introduction of fire-brands into the forest than the application of the Homestead law and the land grants of alternate sections to pine-timber lands.

HORACE B. AYRES.

II. CONSERVATION.

The subject of Forestry was made the leading topic of discussion at the annual meeting of the Paper and Pulp Association in New York in March, 1898. As a result, the mill owners were brought to realize that they were pursuing a very short-sighted policy in stripping their woodlands. Their attention was called to the fact that the Spruce of the Eastern States was rapidly disappearing, and that while only a small part of the capital of a paper mill was invested in woodlands, the enormously valuable water powers and plants would be useless without the raw material.

From this meeting dated the first action on the part of the paper mills of this country looking toward the adoption of scientific management for their timber lands.

When the various mills were combined in the International Paper Company, Mr. A. N. Burbank was placed at

the head of the woodlands department. He instructed the writer of this article (as forester for the company) to examine, first of all, the woodlands of New Hampshire, to report on the stand of Spruce, rate of growth, and the best method of lumbering to insure a supply of wood for the future. Some 100,000 acres owned by the company, in the vicinity of the White Mountains, were first explored.

The stand of Spruce was determined by valuation and surveys, the strip method being used, and all trees down to 5 inches callipered. Then the rate of growth was determined and a preliminary working plan made for the whole tract.

This limited the cutting of Spruce to 12 inches, "breast high," or 14 inches on the stump, which was found to be the same thing and much easier for the choppers to understand. The writer

realizes perfectly that cutting in all cases to 14 inches is by no means the best policy, but it is far better than stripping the land, and was adopted only as a temporary measure until men could be trained to mark the timber which should be cut. This working plan was submitted to Mr. Burbank, who thought favorably of it, and ordered that in all new contracts the cutting of Spruce should be limited to 14 inches.

At the same time Mr. Burbank, after consulting with Mr. Gifford Pinchot, Chief of the Division of Forestry, made application to the division for detailed working plans for over 300,000 acres of timber land. Thus two very important points were gained.

The first detailed working plan is being completed for a very fine tract of about 24,000 acres. A forest ranger will be employed to mark all the trees which are to be cut, superintend the work of the contractor, see that the cutting is carefully done, that all the conditions of the contract are fulfilled, and in the dry season to guard against fire.

The mature and dying Spruce will be cut first wherever possible, and the Fir in all cases to 5 inches, which is the smallest size the mills can well handle. The object in cutting the Fir to 5 inches is to remove the seed trees as soon as possible, and thus guard against its wonderful power of regeneration, as in many cases it would crowd out the Spruce.

Fir alone will not make good pulp, and gives satisfactory results only when united with Spruce, 15 per cent of Fir being the usual allowance.

In New Hampshire, the Spruce growing well up on the sides of the mountains must be clean cut, for any timber which is left blows down and is a dead loss. But in Maine, New York and Vermont this will not always be a necessity, as the mountains are not so steep, and the Spruce secures a firmer hold on the soil. A few mills use a small per cent of Hemlock in mixture with Spruce, but generally it is never cut. No other wood is used for pulp to any extent, so the supply of Spruce must be depended upon.

The hardwoods, with the exception of in a few localities, have no value at present. The Spruce, in a mixed growth of hardwood, is always of a superior quality, has a fairly favorable seed bed and is protected from heavy winds. If the stand of hardwood is not too dense it is allowed to remain, but if it is suppressing the Spruce and preventing regeneration the stumpage is sold.

In land where a heavy stand of Spruce has been clean cut, White Birch is now coming up. This has a ready sale in many sections for bobbin and peg wood, and may be utilized in future years by the paper mills.

The waste of good pulp wood through present methods of lumbering is enormous. Lumbermen have been accustomed for many years to get out saw logs alone, and are very slow to change their system of cutting and learn that a paper mill can use a great deal of wood which a sawmill would not accept. So they continue to top the logs at 7 or 8 inches, thereby losing an average of 18 feet, B. M., per tree, which they could have saved by running the top up to 5 inches. They also chop the stumps about 2 feet above where they could be sawed, thus wasting 20 feet, B. M., per tree.

To guard against this waste our contracts will specify that the timber shall be run up to 5 inches in the tops, and the stumps sawed as close to the ground as possible.

The aim of the company is to have woodlands tributary to each mill with a sufficient stand of Spruce to furnish its annual supply of logs or pulp wood for all time, cutting to 10, 12 or 14 inches, as the case may be, and on a fixed rotation. The International Paper Company owns or controls at present about 1,000,000 acres of Spruce land, which will be operated eventually under this system, thus setting a good example to other owners of Spruce land, by adopting forestry methods in the management of their own woodlands.

E. M. GRIFFITH,

Forester for the International Paper Company.

Recent Legislation.

New York.

A bill was introduced in the Assembly at Albany, authorizing Governor Roosevelt to appoint a state commission to confer with a like commission from the State of New Jersey as to means of preserving the Palisades of the Hudson. Incalculable damage has been done in the destruction of historic landmarks, and besides the voluminous protests on this score by historical societies and individuals, there have been additional remonstrances from adjacent land-owners. The face of the Palisades has been blasted away in a number of places by gigantic charges of dynamite, for the purpose of securing stone blocks for street paving purposes. After years of remonstrances, the matter has reached the attention of the State law-makers.

Governor Roosevelt has named the following as members of the commission to represent the State of New York: Enoch C. Bell, of Nyack; Waldo G. Morse, of Yonkers; and James R. Croes, of Yonkers.

New Jersey.

Governor Voorhees has appointed the following commission to make an examination into the facts and report a plan of procedure for the perpetuation of the Palisades: Franklin W. Hopkins, of Alpine; William A. Linn, of Hackensack; S. Wood McClave, of Edgewater; Elizabeth B. Vermily, of Englewood, and Cecilia Gaines, of Jersey City. This commission will work in conjunction with the New York commission appointed by Governor Roosevelt.

California.

The bills creating a Commission of Forestry and a Commissioner of Irrigation in California, having failed of Governor Gage's approval after passing the Legislature, have been carried into effect, notwithstanding, by the prompt action of the California Water and Forest Society, which initiated and secured the

favorable legislative action on the subject.

Though official sanction has been withheld, it is proposed to carry out the full intent of the measures under the voluntary supervision of this society. The first subject to be considered has been the raising of funds to insure successful efforts. With financial support assured, the working of the plan is expected to demonstrate the necessity for these officials in the State.

The Commission of Forestry appointed by the society consists of Prof. E. W. Hilgard, of the University of California; Prof. Dudley, of Stanford University; Abbot Kinney, of Los Angeles; Warren Olney, Sr., of San Francisco; and Geo. Fowle, of Placer County. The Commissioner of Irrigation is Prof. Geo. Davidson.

The legislation which failed officially, but will thus become operative in fact, provided for the appointment of the officials named to serve without pay; that the Commissioner of Irrigation should co-operate with the United States Geological Survey in preparing surveys, estimates, etc., for sites for storage reservoirs for impounding waters for mining, agricultural and industrial uses; that reports be made on the feasibility, etc., of such reservoirs and irrigating systems and that the Commission of Forestry should devise a means of protecting the forests of the State from destruction by fire or wanton depredations, and recommend means for preserving the forests and of storing and distributing the flood waters of the State.

It is realized that the commissioners can do little more in two years than acquire information, in a field that requires a vast amount of investigation, and formulate recommendations for further progress. This the California Water and Forest Society proposes to do.

In behalf of Governor Gage it is said that he gave his hearty support to both of the two measures introduced, but that

neither of them reached him officially until after final adjournment had been made, without having an appropriation attached.

Massachusetts.

The bill providing for the codification and amendment of the laws relating to the preservation of trees was taken up by the Massachusetts Legislature on an amendment proposed to strike out the provision requiring towns to elect tree wardens. The amendment was rejected, the mover being the only one to vote in its favor. The final vote in favor of the bill was unanimous, 104 votes being cast.

The Metropolitan Park Commission bill was signed by Governor Wolcott on May 27. The bill provides an appropriation of \$500,000 for additional roadways and boulevards.

The forest survey measure has failed in Massachusetts.

Minnesota.

A review of the work accomplished in Minnesota shows that a distinct and gratifying advance was made by the legislature, in the section just closed, in legislation looking to forest preservation. An appropriation of \$20,000 was made to extend the area of Itasca State Park over the contiguous timber lands. To round out this forest park, at the summit sources of the Mississippi, it is necessary to acquire about 8,000 acres, and if the appropriation, half of which is to be expended this year and half next, does not go far enough, the attorney-general is authorized to secure an option for a term of two years on other desirable lands.

The Cross forestry act was passed. It creates a forestry board, consisting of the chief fire warden, the professor of horticulture at the State agricultural college, three persons to be named by the regents of the State university, and four to be recommended by the forestry association, the State agricultural society, the horticultural society and the State game and fish commission. Forestry reserves are created to consist of such State lands as

may be set apart for the purpose or which may be deeded by private owners or granted by the United States Government. The care and management of these reserves is vested in the forestry board.

It is hardly necessary to restate other provisions of the bill relating to the disposition of the income from these lands, or to the comprehensive duties imposed upon the board of reforestation denuded lands, foresting waste lands, preventing the destruction of forests by fire, administering forests on forestry principles, the conservation of forests about the headwaters of rivers, etc., because all these provisions are practically rendered nugatory for the present by the failure of the legislature to make any appropriation to carry them out. An appropriation of \$1,000 annually is made for the actual expenses of the forestry board. As the St. Paul *Pioneer Press* says, not much can be done with so small a sum, but it is doubtless considered the thin edge of a wedge which is to be hammered home in future sessions of the legislature.

Wisconsin.

The Wisconsin legislature, after considering the advisability of taking effective measures to protect the forest interests of the State, finally defeated, on May 2, the bill providing for a commissioner of forestry at a salary of \$2,500 a year, and a number of deputy commissioners. The sum of \$15,000 was estimated for their total salaries and expenses.

Michigan.

A bill was brought before the State Senate providing for the creation of a permanent forestry commission, which is to consist of three members, one to be chosen by the Michigan State Agricultural Society, to serve six years; the second to be chosen by the Michigan State Horticultural Society, to serve four years, and the third to be chosen by the Michigan Academy of Science, to serve two years; the appointments to date from July 1, 1899, and at the expiration of their

several terms the successors of the members so chosen are to be selected in like manner, the term of office to be six years. The commission is to elect one of its members president, another member secretary, maintain an office and records in the Capitol at Lansing, and serve without compensation, but entitled to traveling and other expenses while on business relating to the work of the commission. The secretary may be paid such amount as the commission may determine, not to exceed \$300 a year. The bill included five sections in amplification of the objects intended, making its scope very comprehensive. By amendment the Governor was given the power of appointing the commission. The bill was put under

the head of unfinished business, with good likelihood of final passage. Its main object is to get the movement well started now, to provide recommendations for future legislatures to act upon.

The bill has been passed by the House and Senate, and has gone to the Governor.

Colorado.

The Colorado legislature has passed the Beaman game bill, which had been under consideration for some time. Governor Thomas promptly attached his signature, and reappointed Game Commissioner T. H. Johnson, whom the new law deposed. The bill is very lengthy and comprehensive.



A LUMBER SCENE IN SAN MATEO CO., CAL.

This spot is one of the most picturesque in California. The mill is kept scrupulously clean in order to avoid any fire possibilities. Fifty men are employed during the active season of seven months in the year. The lumber from the mill is hauled on cars for a distance of two miles and then carried to the summit of the mountain by a cable road 3,600 feet long, climbing an elevation of 1,200 feet. At the summit of the ridge the manufactured lumber is stored, says *Wood and Iron*, and teamed from there to any designated point.

The frequency of forest fires in Pennsylvania has led to the employment of detectives to ferret out the malefactors. Three arrests were made in Franklin County, and similar efforts are in progress in Lebanon County.

Forest fires raged in various parts of Mexico during May, destroying growing crops and valuable timber. Many of the fires were of incendiary origin.

THE FORESTER.

A MONTHLY MAGAZINE

Devoted to Arboriculture and Forestry, the
Care and Use of Forests and Forest
Trees, and Related Subjects.

ANNOUNCEMENT.

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SPECIAL ANNOUNCEMENT.

The special summer meeting of the American Forestry Association will be held at Los Angeles, Cal., July 19 and 20. A large number of prominent members of the Association have signified their intention of being present, and it is believed that the meeting will be one of the most interesting and enthusiastic of recent years. A number of papers on live topics will be read, further announcement of which will be made early next month. The leading papers read will be published in the August number of THE FORESTER.

The attention of all readers of THE FORESTER who are desirous of possessing a complete library on the subject of forestry is called to the several notices inserted in the advertising pages of the present issue.

THE increasing public interest in the subject of Forestry is evidenced frequently in letters to THE FORESTER, approving of the work of this Association and its magazine. In a recent letter, one of the best-posted forest experts in the West says: "I am proud of the good work done by the American Forestry Association. We are now beginning to see the practical results of an intelligent agitation of the forestry problem. The National Gov-

ernment and a number of States have taken advanced steps in behalf of forestry. But there is need of still greater work in the economic reform, both West and East."

Life Member.

Roswell Pettibone Flower, former Governor of New York State, and a life member of the American Forestry Association, died suddenly at the Eastport Country Club, Long Island, N. Y., on the evening of May 12. The cause of his death was acute indigestion, which induced heart failure.

Mr. Flower was born in Theresa, Jefferson County, N. Y., on August 7, 1835, the fourth of seven sons of Nathan Flower, a manufacturer.

Spending his early days on a farm, and in his father's wool-carding establishment, he was successively a store clerk, school teacher, deputy postmaster, and jeweler, until 1869. Ten years later on the death of his brother-in-law, Henry Keep, President of the New York Central Railroad, the latter's personal estate came under Mr. Flower's management and brought him into the financial circles of the metropolis.

Mr. Flower was prominent in the Democratic party, representing the Watertown District in the Forty-seventh, Forty-eighth and Forty-ninth Congress. In 1891 he was elected Governor of New York. He refused to consider a renomination, and became a special partner in the firm of Flower & Co. in Wall Street. He became interested in great financial undertakings, in which he made himself a powerful factor.

In 1859 Mr. Flower married Sarah M. Woodruff, who survives him, with one daughter, Emma Gertrude, the wife of John B. Taylor.

The funeral was held May 15 from his New York City home at 597 Fifth Avenue. Services were held at St. Thomas Episcopal Church, of which Mr. Flower had been a warden for many years, and interment was made the next day at Watertown, N. Y.

A Steady Advance.

During the past month seventy annual members and two life members have been elected to membership in the American Forestry Association. These latest advocates of forest conservation represent twenty-five different States, giving very conclusive and gratifying evidence of the spread of interest in the subject of forestry in America.

Life Members.

Emily L. Osgood, 57 Bay State Road, Boston, Mass.
Charles Lathrop Pack, Cleveland, Ohio.

Annual Members.

J. H. Barber, Paso Robles, Cal.
F. R. Barrett, Box 616, Portland, Maine.
Dr. Cheves Beville, Winfield, Ark.
Charles E. Bigelow, 1800 Santa Barbara St.,
Santa Barbara, Cal.
H. P. Bowditch, Jamaica Plain, Mass.
W. J. Brennan, Calispell, Mont.
L. C. Bridget, Little Shasta, Cal.
Frank W. Brooks, 28 Inman St., Cambridge,
Mass.
W. H. Buntain, Santa Fe, N. M.
Turner Buswell, Solon, Maine.
J. I. Campbell, Houston, Tex.
J. M. Coburn, Adobe Walls, Tex.
Miss Helen Collamore, 317 Commonwealth
Avenue, Boston, Mass.
C. A. Colmore, Santa Monica, Cal.
Uriel N. Crocker, 247 Commonwealth Ave-
nue, Boston, Mass.
Rufus H. Darby, Hickory Hill, Fairfax
County, Va.
J. W. Davis, Porterville, Cal.
Henry M. Dunlap, Savoy, Ill.
Morton J. Elrod, University of Montana,
Missoula, Mont.
William Engel, Bangor, Me.
Charles Fitzenreiter, Lake Charles, La.
David B. Flint, 360 Commonwealth Avenue,
Boston, Mass.
Alfred Gaskill, 4309 Springfield Avenue,
Philadelphia, Pa.
Benj. S. C. Gifford, Fall River, Mass.
L. A. Goodman, Westport, Mo.
C. A. Goodyear, Tomah, Wis.
A. A. Grant, Albuquerque, N. M.
Gilbert H. Grosvenor, Amherst, Mass.
Andrew S. Hallidie, 1032 Washington St.,
San Francisco, Cal.
William Herring, Tucson, Ariz.
Robert P. Hill, U. S. Geological Survey,
Washington, D. C.
Lee G. Howell, "Grasmere," Kouts, Ind.
Miss Marian C. Jackson, 88 Marlborough St.,
Boston, Mass.
Thomas W. Jones, Great Falls, Mont.
John L. Kaul, Hollins, Clay Co., Ala.
John H. Kirby, Houston, Tex.
Prof. Charles R. Lanman (Harvard Univer-
sity), 9 Farrar St., Cambridge, Mass.
William E. Leffingwell, Glen Springs, Wat-
kins, N. Y.
A. Liliencrantz, 359 Telegraph Ave., Oak-
land, Cal.
Seth Marshall, San Bernardino, Cal.
Albert Matthews, 145 Beacon Street, Boston,
Mass.
George H. Maxwell, 801 Claus Spreckles
Building, San Francisco, Cal.
Elizabeth Meagher (Mrs. T. F. Meagher),
Southfield, Orange Co., New York.
Heloise Meyer, Hamilton, Mass.
Morrison-Reeves Library, Richmond, Ind.
William H. Niles, Cambridge, Mass.
Warren Olney, 101 Sansome St., San Fran-
cisco, Cal.
J. E. Payne, Cheyenne Wells, Colo.
Pasadena and Mt. Lowe Railway Com-
pany, J. S. Torrane, General Manager, Echo
Mountain, Cal.
James W. Pinchot, 2 Gramercy Park, New
York City.
Mrs. James W. Pinchot, 2 Gramercy Park,
New York City.
Amos R. Eno Pinchot, 2 Gramercy Park,
New York City.
Charles A. Platt, 107 East 27th Street, New
York City.
Prof. R. H. Price, College Station, Tex.
Louis E. K. Robson, 242 Madison St., Mal-
den, Mass.
B. Schlesinger, Brookline, Mass.
P. M. Shelley, Cliff, N. M.
Daniel Smiley, Mohonk Lake, N. Y.
Hugh N. Starnes, University of Georgia,
Athens, Ga.
John Keim Stauffer, Reading, Pa.
Walter Sutton, 2514 Sacramento Street, San
Francisco, Cal.
William W. Thomas, 184 1 2 Middle St., Port-
land, Me.
Edward R. Warren, Walnut Place, Brook-
line, Mass.
J. B. Weber, Bitter Root Forest Reserve,
Hamilton, Mont.

Annual Members—Continued.

Wendell M. Weston, Room 811, 53 State St., Boston, Mass.

J. M. Wilson, Secretary State Board of Irrigation, Lincoln, Neb.

C. M. Winslow, Brandon, Vt.

Jos. Worcester, 1030 Valley St., San Francisco, Cal.

A. Wormser, Wormser City, Sweetgrass Co., Mont.

P. K. Yonge, Pensacola, Florida.

CHIPS AND CLIPS.

"Pitch Pine continues in capital demand" in London.

The agitation in the West for reforesting denuded slopes and waste lands is a hopeful sign for forest conservation.

Large quantities of Mahogany are being brought from the tropics to Baltimore, Md., for finishing.

Mahogany is said to have been brought to England by Sir Walter Raleigh in 1595, but not to have come into general use till 1720.

President McKinley has issued the necessary instructions to secure the admission of common Pine lumber into Cuba free of duty.

Ten carloads of Black Walnut logs were sold recently in Kentucky for export abroad, principally to London, Glasgow and Hamburg.

A new railroad being constructed from Hattiesburg to Jackson, Miss., will open for development a very resourceful section. The line runs for miles through the virgin Pine forests.

The United States has about 450,000,000 acres of forest, but this is being rapidly depleted by the axe and by destructive fires. The Government is now investigating means to prevent or control the latter.

Two thousand acres of timber lands, covered with Fir and Cedar, in Skagit County, Washington, have been sold to Michigan capitalists for \$36,000. It is said that the timber will not be cut for

marketing, but simply held as an investment.

The area and cost of the park lands in Des Moines, Iowa, is computed as follows: West Des Moines, 340 acres at an average cost of \$330 an acre; East Des Moines, 112.55 acres at an average of \$364 an acre.

Eighty-three thousand acres of Pine timber lands, near Pine Bluff, Ark., have been sold for lumbering purposes at an aggregate price of over half a million dollars. This is said to be the largest business deal of the kind in the history of this section.

It is encouraging to note that the New York State College of Forestry has succeeded in planting with valuable tree growths the first fifty acres of burned lands. The college expects to plant every year at least 500 acres. This is the first encouraging step toward reclaiming the losses caused by forest fires.

The "Christmas Tree"—Evergreen—has been adopted by the school children of Montana, by a popular vote, as the State tree. Much enthusiasm was displayed in the consideration of the subject, and the selection was made with practical unanimity.

An evidence of the fact that all the big timber of the country does not come from the Pacific Coast is found in a recent letter to the editor of THE FORESTER. The writer tells of his firm cutting four pieces of timber twenty-two by twenty-four inches and sixty feet long, out of White Pine. This timber was rafted from Michigan the full length of the tree

and cut as wanted, at Cleveland, Ohio, for track scales.

The forest area of all the British possessions in America is estimated at about 800,000,000 acres. The settler has cut his way into the fringe of the vast woodland, but his depredations are nothing as compared with the terrific scourge of fire which has rampaged through it at different times.

The historic White Pine forests of Pennsylvania are so near extinction that, according to a careful estimate, the total standing timber of this kind in the entire State is barely 400 million feet. The larger part of this timber is in five tracts, the residue being in small and scattered lots.

Black Walnut has become so valuable in Indiana that those who are cutting timber of that kind there are exercising great care and economy in the work. Each tree is cut off at the root, in order to save every bit of timber in the stump. Lumber which was considered almost worthless a few years ago is now being worked into costly veneers.

Los Angeles, Cal., gets its great electric power and electric lights from electricity generated by mountain streams, eighty-five miles west of that city. About 40 or 50 per cent of the power generated by the water wheel is carried the eighty-five miles in the form of electrical energy. This is a very high per cent to be obtained from so long a line.

In quoting the sale of the Black Walnut grove at Cassopolis, Mich., from the *May FORESTER*, the *Conservative* says: "For forty years we have been actively exhorting people to plant Walnuts in Nebraska, and besides practicing what we preach, we have several hundred fine Black Walnut trees to show in demonstration of our theories. On a farm near Dunbar we have nearly two hundred trees, which will average five feet in circumference and are worth nearly as much

as a whole quarter section of ordinary unimproved Otoe County land. Plant Walnuts."

All the White Oak timber on a tract of 50,000 acres, in Washington County, Mississippi, about 140 miles south of Memphis, Tenn., has been sold to a firm in Vienna, Austria. There is much valuable timber of other kinds on the tract, and the sale includes the White Oak only. The money consideration is estimated at \$25,000 at the least, and possibly more than double this amount.

An unfortunate circumstance which retards the advancement of irrigation plans in the West is the inconstant interest of a large part of the general public. There has been found to be tumultuous interest in the plan, as in 1873, after lack of water has caused inconvenience and suffering. Last year there was a sudden interest in the water resources of the State. The result this year is said to depend largely upon whether there will be "a good year" or not.

A White Oak tree which was recently cut down in Knox County, Ind., is said to have been one of the largest of the kind ever cut in that section. It measured eight feet four inches at the butt, fifty-three inches at the small end, scaled 7,867 feet and made four twelve foot logs. After being cut the tree was rolled to White River, where it was loaded on a barge. It was then taken to Mount Carmel, Ill., rolled to side track and loaded two logs to a car. The heart of each of the logs was the size of a silver dollar.

Six hundred million feet of standing timber on the coast between Norfolk, Va., and Charleston, S. C., has been acquired by a new corporation, chartered under the laws of Virginia, with the title of the "Atlantic Coast Lumber Company." It is legally authorized to do almost anything in the timber and mineral line, and is permitted by its charter to acquire one million acres of land. It is said that it will practically control the lumber trade

of the coast from Charleston to Boston. Most of the incorporators are Eastern capitalists. The minimum capital, one million dollars, may be increased to twenty millions.

The increasing need of forest conservation is emphasized by a recent dispatch from Memphis, Tenn., to a leading trade journal, saying: "The only trouble is the shortage of timber, which continues, and is likely to become an aggravated evil, instead of diminishing." The woodman's axe is a powerful educator, but the trouble lies in the fact that the knowledge is usually acquired when it is too late to take advantage of it.

In Nebraska the evergreen trees, especially exotic conifers, like the Siberian, Japanese and Chinese Arborvitæ, have been very generally injured, and in many cases killed, by the severity of the past Winter. White Pines, Scotch Pines, and other varieties, which went into the Winter with their roots very dry, have suffered in some counties where old and mature trees, as well as young trees, have been killed. The question is now being asked there why the past Winter caused this great loss, when the trees had escaped it in all the previous severe seasons.

Forest Fires.

Destructive forest fires were reported as raging about Canaan and Averill, Vt., during the middle of May. A wide territory was burned over and thousands of cords of wood were destroyed. The loss amounts to some thousands of dollars. A large crowd of men were engaged for several days in fighting the fires both day and night.

A disastrous timber fire occurred on April 18 between Pestletown and Watford, N. Y. A thousand acres of trees were burned through a brush-pile fire started on a farm.

One of the largest forest fires ever experienced in that section started near

Bohemia Village, N. Y., during the middle of April. After burning all day, the flames swept toward the village at night, endangering many houses on the outskirts of the place. By great vigilance and energetic work the flames were kept back, women and children joining the men in fighting the fire.

During the latter part of May a big forest fire was reported near Port Republic, N. J. It had its origin in a small fire kindled to consume a mass of rubbish, but finally spread beyond control and burned over a large area. Fortunately the fire burned away from the village and did no damage to houses there.

Educational.

The Franklin Forestry Society was organized on Arbor Day, April 22, at Chambersburg, Pa., to create a more general interest in the subject of forestry in that immediate neighborhood. The officers for the current year are: President, Alvin B. Kuhn; Secretary, W. G. Bowers; Treasurer, E. H. Keefer. Much interest has been manifested in the work already undertaken.

The subject of tree-planting will be prominently considered at the Summer meeting of the Missouri State Horticultural Society, at Peirce City, Mo., June 6, 7 and 8. The meeting will be held under the direction of the South West Fruit Growers' Co-operative Union, and special arrangements have been made for accommodating visitors from a distance. Among the papers to be read are: "Deciduous Trees for Street and Lawn," J. M. Irvine, St. Joseph, Mo.; "Ornamental Planting" (with stereopticon views), Prof. J. C. Whitten, Columbia, Mo.; "The Business of Planting Orchards," J. E. Thompson, Windsor, Mo.

The Michigan Hemlock Association has been formed at Saginaw, Mich., to better the conditions of that trade, and secure uniformity of grading, etc.

Recent Publications.

A primer of forestry, soon to be published by the Division of Forestry of the Department of Agriculture, will consist of two small cloth-bound volumes profusely illustrated. Part I, entitled "The Forest," may be expected to appear during the month of June. It will treat of the units which compose the forest, of its character as an organic whole, and of its enemies. Part II will be entitled "Practical Forestry," and will deal with the practice of forestry, with work in the woods, with the relations of the forests to the water and the streams, and will conclude with a brief description of forestry at home and abroad. The intention in preparing these two little volumes has been to make so simple a statement of the essential facts in forestry that it could be used in the schools while at the same time retaining enough of general interest to warrant its circulation among all classes of readers. A more detailed review of Part I will appear in the next number of *THE FORESTER*.

The Maine Agricultural Experiment Station has sent out two bulletins—No. 51, "Feeding Stuff Inspection," and No. 52, "Spraying of Plants." The first-named contains the analyses of the samples of feeding stuffs collected by the station inspectors during the past winter. Bulletin 52 tells why spraying is necessary; when, how and what to spray and where the necessary apparatus can be obtained. Bulletins will be sent to all who apply to the Agricultural Experiment Station, Orono, Me. In writing, please mention *THE FORESTER*.

The Maine Agricultural Experiment Station, at Orono, will shortly make an investigation into the kinds of weeds contained in agricultural seeds sold in that State. Samples of seeds sent in before June 15 will be examined free of charge and a report returned.

The Kentucky Agricultural Experiment Station, Lexington, has just issued Bulletin No. 80, treating of "Some Pests Likely to be Disseminated from Nurseries," and "The Nursery Inspection Law." There has also been issued Bulletin No. 81, describing a method of avoiding lettuce-rot, and a review of potato scab experiments.

The New Hampshire College Agricultural Experiment Station, at Durham, has issued Bulletin 64 on "The Forest Tent Caterpillar." This is a very interesting and valuable treatise, by Clarence M. Weed, showing the life-history, habits, description of the life stages, food plants, abundance, and injuries of these destructive creatures. Their various names, natural enemies among birds, insects, and spiders, and the remedial measures suggested, complete the bulletin. Many illustrations are included.

The Experiment Station of the Utah Agricultural College, at Logan, has issued Bulletin No. 59, on "Utah Sugar Beets in 1898." The subject is reviewed in detail, with an introduction by Director Luther Foster, including sugar factory conditions in Utah, sources for market, relation of the water supply, localities interested and conditions suitable for the industry. Bulletin mailed free on request.

The same station has also issued a folder on "Spraying," containing the most important facts regarding the chief injurious insects and fungous diseases of the fruits of Utah, with directions for their treatment, compiled from the latest results obtained in this and other stations in combatting them. This bulletin is published especially for use in the field by those who spray, and will be sent upon request.

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